Doubtless further experience and research will still further open up the field of hepatic surgery, but it is impossible to doubt that already the ground is well broken up.

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RESULTS OF SOCIN'S OPERATIONS FOR THE RADICAL CURE OF HERNIA AT THE BALE CLINIC.

The *Deutsche Zeitschrift für Chirurgie* for August, 1886 (Bd. xxiv. Hft. 3 and 4) contains a lengthy communication, occupying one hundred and eighteen pages of the journal, from the pen of Johannes Anderegg, of Glarus, Switzerland, which is devoted to a clinical study of the cases of hernia treated by radical operation at the surgical clinic at Bâle, and contains besides the author's original remarks, full statistical data of the material considered, and concise abstracts of the whole number of cases reported upon—one hundred and twenty-eight in all.

The young author had prepared the paper as a thesis for obtaining his diploma ("Inaugural Dissertation") but succumbed to an attack of acute pneumonia, before it could be printed.

The paper is therefore edited by Professor Socin, of Bâle, who, however, has refrained, under the circumstances, from making such corrections and additions, as he would otherwise have suggested to the author.

The object of the paper is to contribute towards the solution of the question as to the real value of the radical cure of hernia by operation; and the results at which the author arrives are contained in eleven paragraphs submitted for discussion, which we give below:—

Some of the cases considered were published by Professor Socin at the Eighth Congress of German Surgeons in 1879; and since then three separate dissertations based upon cases treated at the Bâle surgical clinic have been written, prior to the year 1881, all of which are taken note of in the present paper.

The subject matter embraces one hundred and thirty-six operations in all, which were performed upon one hundred and twenty-eight patients. In fifty-six cases non-incarcerated herniæ were operated upon,

while the operation was performed seventy-one times for incarceration. In nine cases of incarcerated intestine, in which herniotomy was performed, the radical operation was, however, contraindicated; and these latter cases are only considered in regard to the question of mortality after herniotomy.

Generally speaking, the method of operation was as follows, antiseptic precautions being observed throughout:—

The sac was dissected out, either before or after it had been incised, and was then ligated as high up as possible, either by means of a single ligature or doubly after transfixion of the pedicle with a suture. The rest of the sac was then cut away, and the pedicle returned to the abdominal cavity. In two cases the ligatures slipped off the pedicle, in the moment that it was being returned, and could not again be replaced; no peritonitis ensued, however. Catgut was used in all but eleven cases, where silk was preferred. The opening of the inguinal canal was sutured in forty-four cases (of 89) of inguinal hernia. Thorough disinfection of the parts was carried out before replacing them in the abdomen.

A great number of statistical figures are given in regard to the different points of interest concerning the operative treatment, many of which are of special value.

Thus in six per cent. of the cases the intestine was found to be adherent to the sac.

The mortality for the radical operation performed for non-incarcerated intestine was found to be 3.6 per cent. Two cases out of fifty six died from the direct effects of the operation, one of sepsis and hæmorrhage from the pedicle, the other of gangrene of the integument. Of forty-four cases of excision of omentum one died from secondary hæmorrhage.

Comparing these figures with the results of other statistical publications the author finds the mortality percentage for two hundred and seventy-three operations to be 5.1. The mortality percentage, if calculated for different ages, amounts to 8.3 for patients under ten (24 cases); to 1.6 between the ages of 11 and 40 years (125 cases) and to 8.1 for patients over 41 and under 76 (111 cases). The latter figure 8.1 is still increased by intercurrent affections.

The age between 11 and 30 years is the most favorable for operation; only one death having occurred in seventy-five cases from secondary hæmorrhage from the exsected omentum; so that the mortality percentage for operative treatment for free hernia without exsection of omentum at this age is 0%.

On the other hand large herniæ show an unfavorable influence on mortality statistics; so that elderly patients with large herniæ, at the operation of which omentum was excised, have a mortality of 40%; young individuals, with small herniæ, without resection of omentum have 0%.

The mortality for simple herniotomy for incarcerated hernia was found to be 24.3 per cent—28 per cent. for the crural and 9.8 per cent. for the inguinal varieties; so that the life of a patient having a crural hernia is fourteen times as much in danger as that of one having an inguinal hernia.

In four cases replacement '*en masse*' had been made, in three of which fatal termination ensued through peritonitis.

The influence of the duration of incarceration before operation was found to increase the mortality percentage from 1.28 to 26.3 after the third day. Incarceration has also a different influence upon the mortality—percentage according to the age of the individual; before the 40th year we have 9.5 per cent.; after that 30.2 per cent.

In six cases where the abdominal cavity had been drained, death resulted in every case. In nine cases the intestine had been sutured; three of these died.

As regards the course of wound-healing of the 114 radical operations performed, 79 healed by primary intention in an average of 15 days; in 35 cases some disturbance occurred, and the average time of recovery was 35 days. Total average time for all cases 22 days. In three cases, namely, suppuration ensued owing to the use of impure catgut. For this reason silk was used in eleven cases, in three of which it caused disturbance, the ligature coming away after 4 and 17 months respectively in two cases, and a fistula remaining in the third case for nine months.

The influence of different features of the cases upon the course of

recovery is also noted; thus disturbances occurred more frequently and were more severe in character in the treatment of non-incarcerated inguinal hernia in males, than in incarcerated hernia.

This fact, however, must be explained by taking the size of the individual hernia into consideration. On the other hand incarcerated inguinal herniæ in females, as well as all crural herniæ show more disturbances in the course of recovery than do the non-incarcerated ones; in these cases a notable difference in size did not exist.

For the smallest hernia the average time of recovery amounted to twenty-five days, disturbances having occurred to the number of 20 per cent. In scrotal hernia on the contrary disturbances occurred in 69 per cent, of the cases—these being the largest herniæ of all: the longest term of recovery was eighty-four days.

No difference as to size was found in crural hernia in any respect. The age of the individual had no demonstrable influence upon the course of recovery.

The course of wound-healing is primarily influenced, as is to be expected, by the operative treatment. But as the sac was extirpated in each case—the question as to whether this procedure is advisable could not be answered. Suture of the canal, or constricting ring, performed thirty-seven times in seventy-eight cases, appears to have caused disturbances in the wound-healing process; and the author believes this due to the traction occasioned by the sutures.

Suture of the vaginal process above the testicle, in order to close the tunica vaginalis testis propria was always attended by good results. Swelling of the testicle was frequently observed in cases where the sac was adherent and difficult to dissect out, probably owing to some lesion of the spermatic cord. In three of the entire number of cases peritonitic symptoms appeared; in two thrombosis of veins in the lower extremities, and twice decubitus occurred.

In collecting the final results of all the radical operations the author was able to hear from one hundred and five out of the one hundred and fourteen patients. 61 per cent. were found completely cured; but in 39 per cent. of the cases recurrence set in. Three-fourths of the whole number of recurrences were observed within the first year after

operation; and the probability of a recurrence setting in after the second year was calculated at $^1/_{50}$ per year for each patient.

Herniæ of long standing were found to recur easily and to grow rapidly. The following observations were made relative to the recurrence of hernia treated by radical operation:

As to variety: inguinal h. 41% recurrence. Crural 33%. As to duration of h. before operation: under ten years 28% rec.; over ten 65%; very recent h. 0%. As to size of h.: scrotal h. 78% rec.; non-scrotal 23%. As to the age of the patient at operation: under twenty years 14% recurrence; 21-40 years 49%; 41-60 years 41%; 61-77 years 29%. As to heredity: present 45% rec.; no heredity: 34%.

As to presence of hernia in the same patient on the side not operated upon (individual disposition): present 52% rec; not present 34%. As to the occupation of the patient after operation: hard work 38% rec.; light work 53% rec. (!). Recurrences when cough was present 47%, with no cough 32%.

As to suture of canal: small hernia, canal sutured 28% rec.; not sutured 27%; large hernia, canal sutured 53%; not sutured 48% rec.

These last figures admit no practical conclusion. The author is in favor of omitting the suture of the canal or ring merely because disturbances occur more frequently after it in the course of wound-healing.

Excision of atrophic testicles gives better results than to allow them to remain. Whether the sac itself is ligated or sutured, does not influence the recurrence of the hernia; but it should be closed at as high a point as possible, the sac being either pulled out as far as possible, or the inguinal canal laid open.

Interesting figures are given in answer to the question whether the use of a truss after operation influences the recurrence of the trouble. If no truss was worn, 27% recurrences ensued; if one was worn part of the time, 44%; and if all the time, 62% recurrences were observed.

In inguinal hernia alone constant wearing of a truss induced 54 per cent. recurrences, while with no truss only 24 per cent. occurred.

Although the author does not attempt to explain these figures fully—he points out that wearing a truss may enlarge the hernial aperture. by pressing the integument in towards the abdominal cavity during the

day in the same manner that the hernia presses it out during the night.

The practical conclusions which the author draws from his investigations are that the radical operation should be performed as early as possible in all cases of hernia. The procedure is contraindicated, however, by a bad general condition of health. Elderly patients as well as children should not be operated upon, or at least, only in case rapid enlargement of the hernia occurs.

Recent inguinal hernia should be operated upon in all cases; crural hernia, however, not without some special indication, as liability to become incarcerated, etc. In the majority of cases resection of the omentum is indicated.

In case of incarceration of a crural hernia, no time should be lost before operating; in incarcerated inguinal hernia, however, taxis may be first attempted. The age of the patient should not be allowed to influence these latter rules.

In case simple herniotomy is to be performed—the radical operation may be combined with it in most all cases.

The theses submitted are as follows:

(1). Permanent cure of herniæ by operation is possible; it is the rule in herniæ of recent date; in those of older date it is the exception; generally speaking cure may be looked for with the more certainty, the more recent and the smaller the rupture is.

(2.) Permanent cure is more probable in individuals who have not completed their growth, than in those who have ceased to grow, other beings being equal.

(3). The prognosis as to the permanency of the cure is unfavorably influenced by the existence of another (double) hernia in the same individual, as well as by the presence of hernia in the nearest relations of the patient.

(4). Habitual bodily labor appears to favor the permanency of the cure. Coughing, on the contrary, tends to cause relapse.

(5). The probability of recurrence constantly decreases from the time of operation, being very slight indeed after lapse of two years.

(6). The risk of life by the radical operation is in great measure dependent upon (1) the age of the patient. (2) The variety and size of the hernia. (3) The necessity of exsecting the omentum.

(7) In youthful and middle-aged individuals enjoying good general health quite recent inguinal hernia specially require operation; radical operation is furthermore indicated in all cases where the existence of the hernia causes any trouble, and the more so, the smaller the rupture, and the younger the individual is. Very large herniæ occurring in old or infirm people are to be considered inoperable.

(8). Herniotomy should be performed without delay in cases of incarcerated crural hernia, as well as in small incarcerated inguinal herniæ. The larger inguinal herniæ are, the more frequently attempts at replacement should be repeated. Radical operation should be performed after herniotomy in every case unless special contraindications are present.

(9). The most favorable method of performing the radical operation is to ligate the sac doubly or repeatedly at as high a point as possible, and excise it. Whether the ligature of the sac in inguinal herniæ is best done after withdrawing the sac out of the inguinal canal, or after incising the canal, cannot as yet be finally decided. Suture of the constricting ring is not advisable.

(10). Adherent or hypertrophic portions of omentum; and such as have undergone textural changes by incarceration, are generally to be exsected after application of a ligature *en masse* to the pedicle; the stumps are to be returned to the abdominal cavity.

(11). After operation the wearing of a truss is not permissible, as long as a relapse has not occurred.—*Deutsche Zeitschr. f. Chirg.* Vol. 24. Hft. 3 and 4, August 25, 1886.

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